

Question Mark

1947



SCIENCE
U OF M

A.W. DALES

A large, stylized spotlight beam originates from the top left, shining down towards the center. The word "Spotlight" is written in a large, elegant script font, with the "S" being particularly large and stylized. The beam itself is a dark, textured shape that tapers as it goes down. In the center of the beam, there is a rectangular card for "WESTERN ENGRAVING BUREAU LIMITED".

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A Liberal Education = Science + . . . ?

by DR. J. F. T. YOUNG, Professor of Physics



DR. J. F. T. YOUNG
*Honorary President,
Science Students Association.*

The completion and balancing of the above equation forms one of the major problems of modern university education and an examination of its implications is both necessary and timely in this era of new values and new problems in human affairs.

A liberal education may be defined as "the process by which we attempt to transmit to the next generation the heritage of culture which our own generation possesses." It is an extremely important process: starting with the disciplinary training familiarly referred to as the three R's, it reaches its next stage with the acquisition of current knowledge and attains its highest level with critical reviews of the collected experience of the race. This last phase is in particular the function of liberal education at the university level. In contrast, professional and vocational training is directed towards training for a living, towards learning the laws of the world, the properties of materials we use, and the techniques of manipulating them. The liberal education is directed toward the

good life and the full life, regardless of how the living is made. It deals with universal knowledge and experience viewed against the back-drop of history.

This "heritage of culture" has two chief components, — knowledge and wisdom, or in other words, science and values. The distinction between these must be fully appreciated. The realm of science is the public domain of positive knowledge. The world of values is the private domain of personal convictions. The two together form the universe in which we live. Knowledge is public property. It can be transmitted directly, it can be pooled, it can be stored in libraries, and consequently it accumulates from generation to generation. Wisdom on the other hand is strictly private. It is not readily communicated, hence it cannot be pooled or stored and does not accumulate through the ages. Each of us acquire our own wisdom from our own experience. We may attempt to pass it along to others by vicarious experience in the hope of favorable reactions. The proverb — "You can't expect to find old heads on young shoulders" — expresses the idea exactly.

The liberal education is not intended to develop specialisation in any field but its goal is general knowledge, and the integration of partial glimpses to form a synthesized picture of the world. At the same time it considers the methods by which men proceed from the known to the unknown. Its purpose is to make capable and cultivated human beings; the more there are in this category the greater is the benefit to society. Democracy, in particular, depends for its continued existence upon the ability of citizens to distinguish between words and the facts they represent, and to judge between conflicting opinions hurled at them by the instruments of modern propaganda.

The study of science makes a valuable contribution to the powers of discernment as John Stuart Mill emphasizes, — "Without an elementary knowledge of scientific truths, the public never knows what is certain and what is not; who are entitled to speak with authority, and who are not; they have no faith in

the testimony of science or they are ready dupes of charlatans and imposters. They alternate between ignorant distrust and blind, often misplaced, confidence".

Men of science, like all other men, spend most of their lives in the world of values as they live their ordinary roles as citizens and human beings. Perhaps, just now, in an atomic age they must bear a larger than usual share of the common responsibility. At times they can slip away to their other world of research that knows nothing of values — in the attempt to find objective truth without regard to personal desires. Each by his own technique seeks to explore the universe as it is; not as it should be but as it is. Their conscious aim is to reach a completely detached attitude, so that from motives of sheer curiosity, they may understand the world; not to reform it but merely to pick its mechanism apart. The process began with the Ancients and produced its first notable successes under Galileo and Newton when modern science began its course. The unique characteristic of science is that it is progressive, as each generation makes its contribution to the existing store of knowledge. As Newton said, "If I have seen farther, it is by standing on the shoulders of giants." Yet today these very giants are dwarfed by the immense superstructure of science erected on the foundations they laid so well.

The world of values is very different from that other world of scientific knowledge. George Sarton in his "Introduction to the History of Science" has pointed the distinction in this way: "The saints of today are not necessarily more saintly than those of a thousand years ago; our artists are not necessarily greater than those of early Greece; they are likely to be inferior; and, of course, our men of science are not necessarily more intelligent than those of old; yet, one thing is certain, their knowledge is at once more extensive and more accurate. The acquisition and systemization of positive knowledge is the only human activity that is truly cumulative and progressive."

Science deals only with those judgments on which it is possible to obtain universal agreement as the invariable associations of events, or properties, which are known as the laws of science. The agreement is reached after repeated experiment and observation — impersonal evidence which men of all races and all creeds must admit to be true. The methods of science are well known; first, the discovery of laws, then the explanation of

laws by theories, and finally, the testing of the theories by new observations. It does not matter whether the theories are inferred, invented, or dreamed, since they are merely working hypotheses or plausible interpretations of the available data. There may be, and often are, many theories proposed to satisfy a given set of data but, since each of the theories predicts new, hitherto unobserved laws, it is therefore susceptible to these new observations. Theories of the ad hoc type are always suspect. Their validity must be measured by the verification of predictions. This procedure is the very essence of the scientific method, and acts as a brake, or control, on the powerful but dangerous method of induction. When a theory cannot be tested, its appeal is largely aesthetic. Under these general conditions the field of science is necessarily the objective world of phenomena. It deals with probable knowledge only; its methods are empirical; its philosophy pragmatic. The scientist explores the world of phenomena by successive approximations. He weighs probabilities for he knows that his data are never exact in all respects (Heisenberg's Principle) and that his theories must be tested. It is quite natural, indeed inevitable, that he becomes a healthy sceptic, exercising suspended judgment and a disciplined imagination.

But the world of pure values is not concerned at all with probable knowledge. It seeks to reach finality in eternal, ultimate truth, and sometimes through the unique and compelling experience of mystical insight, as for example in religious experience, a man knows, beyond any shadow of doubt, that he has been in touch with a reality that lies beyond and behind mere phenomena. He himself is completely convinced by his experience but he cannot explain or communicate that certainty. It is a private revelation. He may be right but, unless others share a similar revelation, they cannot know.

As in the past the old nineteenth century conception still pervades the humanities too widely — that the proper study of mankind is man "as an ardent soul whose thought was more interesting than his work, and whose love and play and dreams and songs were more important than his thoughts" to quote from Frederick Barry's 'The Scientific Habit of Thought'. These high ideals of the humanities must always be held in esteem but surely the emphasis is too much on the past. Sarton has said that he does not know which is the poorer, the old humanist who does not recognise the cultural value of

science, or the young scientist who lacks appreciation of beauty, of urbanity, and of reverence.

Today we must take a larger view. Surely the proper study of man is the universe, of which man is part. The realm of science and the world of values must both be explored and made to yield their contributions to human welfare. It is almost self-evident in these days that wisdom without knowledge is futile and in turn knowledge without wisdom is dangerous.

As it stands at present these two aspects of the universe are distinct, just as are a quantum and wave theory of light, and have not merged, if they ever will, into a more general conception. Any attempt at integration will probably have to recognise and preserve the distinction. The humanist must recognize the complete authority of science within its proper field and the scientist must

recognise and admit the limitations of that field.

Granted these happy conditions the two can cooperate in working toward the ideal of a truly liberal education. The common meeting ground can be found in the study of history — in particular the history of culture, of ideas, and of science. The historian with a general knowledge of science, and the scientist with an appreciation of scholarship can both contribute distinctively to this critical review of the record of the intellectual and cultural achievements of the human race. This should be the fundamental principle underlying any and all of our proposed changes of curriculum — to liberalise the professional education but to avoid professionalizing the liberal education, in the recognition of the thesis that while it is necessary to make a living in this world, it is definitely of immense importance to live well.

A Tribute to Departed Merit

The death of Associate Professor William Abraham Anderson has deprived the Board of Governors of a tireless and selfless servant, the Department of Physics of a loyal colleague, and the student body of a skilful and earnest teacher, and wise and sympathetic counsellor. All three elements of the university have suffered a loss which will be difficult to redeem.

His academic career started in the Honours Mathematics and Physics course at the University of Toronto but was completed at this university, where he graduated as Gold Medalist in 1923. It may be worth noting that, including extra courses, he took practically all the work offered in all the sciences at that time. This gave a remarkably broad background for his life-work in the teaching profession. After some years in the secondary schools, chiefly at Virden as teacher and later as principal, he joined the staff of the Department of Physics in 1929 as lecturer, advanced to the rank of Assistant Professor, and just this session to that of Associate Professor.

Professor Anderson was always a keen participant in sports. As a student he played on the line of the University of Manitoba rugby team and, recalling his broad, heavy-set frame, one can well imagine him as a very formidable guard or middle wing. In his later years this love of sports led him to be a persistent, if inconsistent, golfer; as a

physicist always able to diagnose what had gone wrong on the shot but as a golfer not able to devise and apply the remedy. This gave the game an irresistible charm for him. In winter he curled in the City Schoolmasters League and enjoyed the game immensely.

In his chosen profession Professor Anderson showed an indefatigable energy and a meticulous attention to detail, a fairness of judgment and an equability of temperament which were outstanding. He laboured long hours to prepare for his lecture demonstrations and to keep the laboratories in his charge running smoothly. He never lost his temper over stupid mistakes and damage to apparatus but hastened to repair it or improvise a replacement. His whole life and his loyalty to his colleagues, to the university, and to the students would seemed to have marked him out as an outstanding example to the classic ideal of 'mens sana in corpore sano', but we know now that the latter part had not been true for some time.

The University is the poorer in many respects by his death. The Department of Physics has suffered a loss which is almost staggering. If he had any regrets at the closing moments of his life, I am sure that among them would be one, that he would not be here to play his part in the development of the new University of Manitoba.



HUGH H. SAUNDERSON
B.A., M.Sc., Ph.D., F.C.I.C.
Dean of Arts and Science

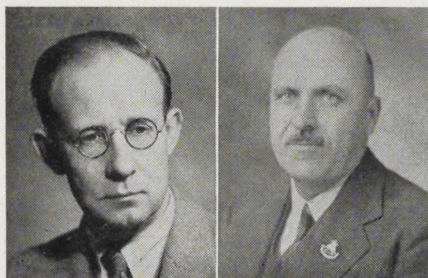
A MESSAGE FROM THE DEAN

Science students have chosen as their emblem the question mark. It serves to indicate alike our curiosity about things and our ignorance of them. It is true that during the past centuries, we have managed to learn a great deal about our material universe. However, each new discovery opens up new regions to explore so that there is a constantly expanding area of the unknown. Many of you will find here a satisfying field of activity. In the area of pure science, dealing as it does with material things, the working rules and the methods have been fairly well laid down for our guidance. Within this field a conscientious and thorough worker can move ahead with reasonable assurance of steady progress.

There is a new field, however, to which we must devote increasing attention but where progress may be more difficult. This field is in the relationship of our scientific discoveries to the well-being of mankind. Here the techniques and methods of pure science cannot be used so readily, because we are dealing with feelings, desires, and hopes as well as with material things. It is not good enough to say that we will make the discoveries and let the non-scientists worry about what effect they will have. The non-scientists don't know the possibilities of the discoveries. The scientist must be a citizen. This is a field which will call on all our resources or religion, philosophy, sociology and scientific factual knowledge. The challenge is great because the opportunities are great. My hope is that the response may also be great.

DEPARTMENT OF PHYSICS

by BILL MEDWAY and EPH MILLER



Bernard G. Whitmore John F. Todd Young

BERNARD G. WHITMORE

Assistant Professor of Physics, B.Sc. 1927, University of London. Came to Canada and obtained his M.A. in 1930 at the University of Toronto. After that he continued his post-graduate work in other countries. Obtained his Ph.D. in 1933 at the University of Leipzig. After leaving Leipzig Dr. Whitmore taught physics at several English schools, and came to the University of Manitoba in January, 1946. His field of research is the High Frequency Conductivity of Electrolytic Solutions.

JOHN FRANCIS TODD YOUNG

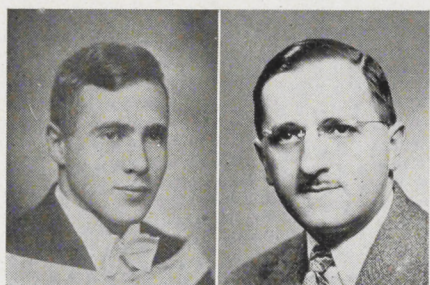
Professor of Physics, Head of the Department of Physics, B.A. University of Toronto 1916, Gold Medallist in Physics. Upon graduation jointed the R.C.N.V.R. and worked for the British Admiralty on Magnetic Mines, Destructor M. and L. Mines, in the Department of Scientific Research and Experiment. Returned to Toronto for his Ph.D., 1923. Came to Manitoba in 1924 as Assistant Professor of Physics, and became head of the department on the retirement of Dr. Allen. Dr. Young's main research interests lie in the field of X-ray diffraction. At present he is busy looking for a larger staff.

BRUCE LUTZ

Lecturer in Physics, B.A. (Hons.), M.A. University of Western Ontario, 1942-44. Joined the R.C.N.V.R. in 1944 and worked on radar. Came to Manitoba last September following his discharge. At present Mr. Lutz is on reserve for the Navy. His field of interest is Electronics, especially those parts connected with High Frequency Radiations, Field Patterns, and Antenna Designs. He hopes to carry on further post-graduate study in this field.

SAMUEL MORTON NEAMTAM

Assistant Professor of Physics, B.Sc. (Hons.) 1934, Ph.D. 1937, McGill University. M.A. in Meteorology, Toronto. For his Ph.D. he did research on the Stark Effect in the Molecular Spectrum of Deuterium. Received a National Research bursary, 1936-37. In Canadian Meteorological Service, 1938-46. Has published a number of papers on Theoretical Meteorology. Came to Manitoba last summer.



Bruce Lutz Samuel M. Neamtam

J. KELSO MARSHALL

Lecturer in Physics, B.A. (Hons.), 1939, M.A., 1941, University of British Columbia. Following this, he joined the National Research Council and did research in optics. Was on a Government Inspection Board on Radar. Came to Manitoba in January, 1946, after being released from the National Research Council. Mr. Marshall's field of interest is in Radio and allied subjects. His outside interests include badminton.

MAXWELL EDWARD KETTNER

Lecturer in Physics, B.Sc. (Hons.), 1942, at University of Manitoba. Served with the Army Signal Corps. Claimed by Manitoba in September, 1945. Mr. Kettner hopes to start on his M.Sc. when the pressure of work lessens somewhat. Interested in Spectroscopy. He is the proud father of two children.

J. WARD GREENWOOD

Lecturer in Physics, B.Sc., 1946, at the University of Manitoba. Editor of the Telephone Directory, 1944-45-46. President of the Phi Kappa Pi fraternity, 1945-46. Last summer Mr. Greenwood was a research operator for the Hudson Bay Mining and Smelting Company. He intends to go on in Education, and is interested in music and the liberal arts.

HARVEY M. PARKHURST

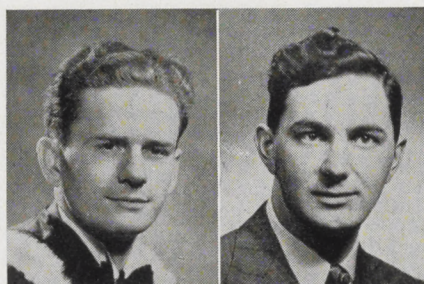
Lecturer in Physics, B.Sc. (Hons.), 1946, at University of Manitoba. After finishing his fourth year he spent three and a half years as an instructor in Meteorology to the R.A.F. and R.C.A.F. Outside interests are bowling, hockey, tennis and golf. Further studies contemplated in Physics and Mathematics.

MARTIN C. MARTIN

Lecturer in Physics, B.Sc. 1945, at St. Francis Xavier College, Antigonish, Nova Scotia. Was Instructor of Physics at University of New Brunswick, 1945-46. Further studies contemplated in Modern Physics. Interested in skating and hockey.



J. Kelso Marshall Maxwell E. Kettner



J. Ward Greenwood Harvey M. Parkhurst

DEPARTMENT OF ZOOLOGY

by W. B. EWART

RONALD K. STEWART-HAY

Lecturer in Zoology. B.Sc., M.Sc., University of Manitoba. Post-graduate work at University of Edinburgh. Expert on all phases of Zoology — Vertebrate, Invertebrate, Chordate Anatomy. Mr. Stewart-Hay is especially interested in Physiology and Embryology. He is a member of the Canadian Association of Scientific Workers, and a curator of the Manitoba Museum.

JAMES ARCHIE McLEOD

M.Sc. University of Manitoba, 1933. Instructor at the University of Western Ontario for a year. Received a Diploma in Education from Manitoba in 1935. Joined the staff of the University of Manitoba in 1937. Took a teaching position at the University of Minnesota. In 1939 the University of Manitoba conferred upon him the degree of Doctor of Philosophy. He is the publisher of several scientific papers on such topics as the parasites of the Genus *Citellus*, Cercarial Dermatitis, and Schistosomid Trematodes.



R. K. Stewart-Hay

James A. McLeod

MICHAEL G. LYSENKO

Lecturer in Zoology. B.A., 1939, from Brandon College. Diploma in Education, 1940, from University of Manitoba. Employed by Ducks Unlimited (Canada) during summer, in Biological survey work. Came on staff in Fall of 1946.



Michael G. Lysenko

ROBERT ARNOLD WARDLE

Professor of Zoology. Head, Department of Zoology. M.Sc. University of Manchester. Served on the Continent in World War I. Extensive traveller, having conducted Zoological Expeditions in Egypt and the Sudan. Former Rockefeller travelling lecturer in Entomology. Renowned for his quick wit and storehouse of humour, he is now working on two books, a Monograph on Cestodes, and the "History of Humour". Publisher of innumerable scientific papers, Professor Wardle is a leading Entomologist. He is a Fellow of the Royal Society of Canada.

DEPARTMENT OF PHYSICS

DR. MAY SMITH

Lecturer in Physics. B.A. 1928, M.A. 1929, and Ph.D. 1933, all at the University of Toronto. Was awarded a Royal Society Scholarship in 1935, which enabled her to go to Upsala, Sweden, where she studied until Easter, 1936. Following this she attended University College, University of London, for a year. Co-authoress of a text-book on "The Physical Properties of Colloid Solutions". Dr. Smith has not had much time to devote to physics since then, having been preoccupied with raising a family.



Dr. May Smith

PATRICK ANDERSON MACDONALD

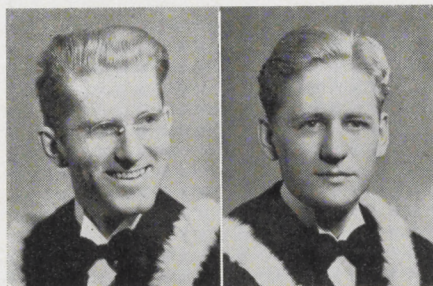
Assistant Professor of Physics. B.Sc., M.Sc., University of Manitoba, 1925-26. Post-graduate work at McGill and California Institute of Technology. In 1930 he received the first and only Ph.D. in Physics ever awarded from the University of Manitoba. Appointed Radium Physicist in 1930 and is now Executive Director of Manitoba Cancer Relief and Research Institute, which acts as a central handling house of Radium Emanation products supplying the medical profession. Dr. MacDonald held various National Research Council Fellowships. His research program includes Electronics, where he is attempting to develop Electronic Amplifying devices to increase the Sensitivity of Spectrum Analysis of Blood. Also carried on research in the Absorptive Spectra of Ultra-violet and in the design and development of High Voltage X-ray Tubes for X-ray therapy.

HAROLD D. JONASSON

Lecturer in Physics. B.Sc., 1946, at the University of Manitoba. Interested in music. Further studies contemplated.

G. LORNE MARKUSSON

Lecturer in Physics. B.Sc., 1946, University of Manitoba. Outside interests include hockey, bowling, billiards, golf and tennis. He expects to take further studies in Physics.



Harold D. Jonasson G. Lorne Markusson

DEPARTMENT OF CHEMISTRY

by CHRIS REID

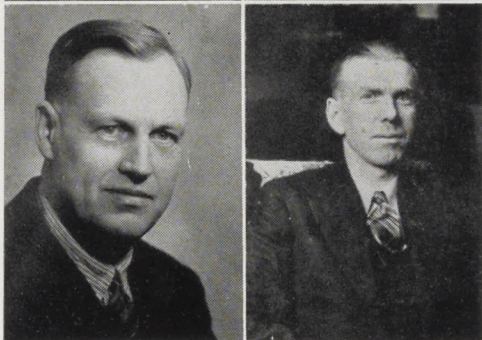


ALAN N. CAMPBELL

Professor of Chemistry and Head of the Department. He obtained his M.Sc. and Ph.D. at London and his D.Sc. in 1929 at Aberdeen. After lecturing at Aberdeen, 1925-30, he came to our university as assistant professor of Physical Chemistry. His memberships in numerous scientific societies include: Fellow of Chemical Society, Fellow Society of Chemical Industry, Fellow Faraday Society and Fellow Royal Society of Canada. Dr. Campbell has written a book on the "Phase Rule" and published papers on Electro Chemistry and Physical Chemistry.

PAUL G. HIEBERT

Our Associate Professor of Chemistry. Born many years ago (Dr. Hiebert refuses to discuss his age). He is an honorary member of the English Department and is interested in all things including Chemistry. He holds an honorary degree of M.A. from the University of Toronto. In his spare time he is engaged in writing *The-Book-To-End-All-Books*, entitled "Truth is an Adventure". Dr. Hiebert is also endowed with a B.A. from Manitoba and an M.Sc., Ph.D. from McGill.



ALLEN D. ROBINSON

Assistant Professor of Chemistry. Born in Ontario. Received his B.A. and M.A. at University of Saskatchewan, 1925-27. Received his Ph.D. at University of Minnesota, 1927-30 and became assistant chemist at the New Hampshire Agricultural Experimental Station. Dr. Robinson has done research on Physical Chemistry of Proteins and on animal and human nutrition.

EDWARD HAROLD CHARLESWORTH

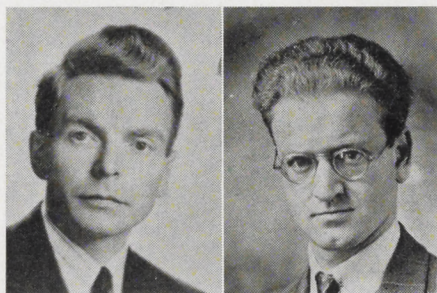
Assistant Professor of Chemistry. Born in Marpeth, Ont. B.A. 1930, M.A. 1931, Queen's University. Was awarded an 1851 Exhibition Scholarship and attended Oxford University, where he received his Ph.D. in 1933. After instructing at Queen's, 1934-37, he came to Manitoba. Dr. Charlesworth has done a great deal of research in the field of Organic Chemistry. Possesses a F.C.I.C.

Alan N. Campbell
Allen D. Robinson

Paul G. Hiebert
Edward H. Charlesworth

NORMAN O. SMITH

Assistant Professor of Chemistry. A home-town product, he received his B.Sc. and M.Sc. at our university during 1935-36. Obtained his Ph.D. at, and became teaching fellow at N.Y.U., 1936-39. He returned to U. of M. in 1939 as lecturer and was made Assistant Professor in 1946. Dr. Smith has done extensive work in Inorganic and Physical Chemistry, specializing in Heterogeneous Equilibrium, Solid Solutions and Hydrates. His other interest, music, has made him an Associate of the Canadian College of Organists and he is organist and choir-master at one of our city's churches. Besides this, he is a member of the Canadian Institute of Chemistry, Sigma Xi, and Phi Lambda Upsilon Fraternities.



MILTON KIRSCH

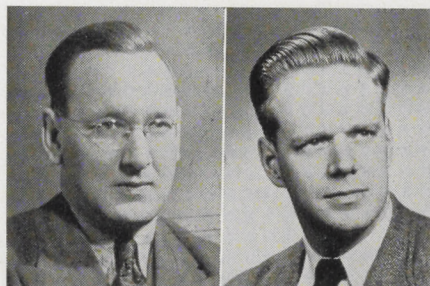
Lecturer in Chemistry. B.Sc., Ph.D., McGill University, 1942-45. Worked with the National Research Council. Is a member of the Sigma Xi and Canadian Association of Scientific Workers.

Norman O. Smith

Milton Kirsch

BRUCE STEVENSON

Lecturer in Chemistry. B.Sc., M.Sc., U. of Sask., 1935-38. Did post-graduate work at U. of Wisconsin in Physical Chemistry. Mr. Stevenson is now interested in the field of Organic Chemistry and is a member of the Canadian Institute of Chemistry.



Bruce Stevenson

Edwin J. Pritchard

EDWIN J. PRITCHARD

Lecturer in Chemistry, B.Sc. and M.Sc., U. of M., 1942-43. Studied at University of Toronto for a year, then worked with the National Research Council in the explosives field.

DEPARTMENT OF GEOLOGY

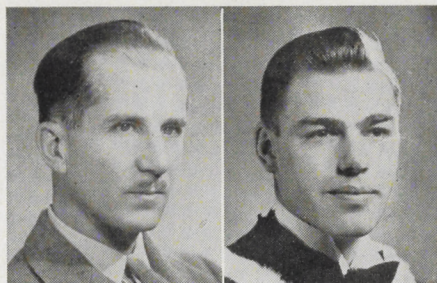
by TOM OLIVER

GEORGE McLEOD BROWNELL

Head of the Department of Geology. M.Sc., University of Manitoba, Ph.D. University of Minnesota. Served with the R.C.A.F. and was formerly assistant in geology at Minnesota. Dr. Brownell has done extensive field work with the Canadian Geological Survey and with the Manitoba Mines Branch.

JAMES F. DAVIES

Lecturer in Geology. B.Sc. (Hons.) 1946 at the University of Manitoba. President of the Geology Club in 1945-46. Future work to be in Economic Geology.



G. McLeod Brownell

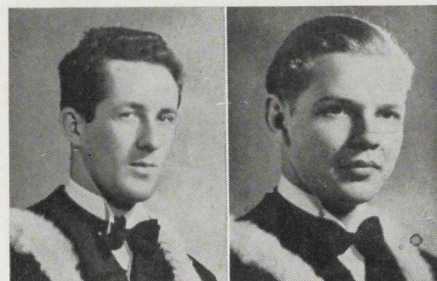
James F. Davies

DAVID S. ROBERTSON

Lecturer in Geology. B.Sc. (Hons.) University of Manitoba. Lectures in Petrology and Petrography. Past President of U.M.S.U. Member of Delta Upsilon fraternity. Plans to continue work in Petrology.

HAROLD A. C. JOHNSON

Lecturer in Geology. B.Sc. (Hons.) University of Manitoba. Graduated in 1946. Very active in sports and other student activities. Ambition is to be a mining geologist.



David S. Robertson

Harold A. C. Johnson

EDWARD I. LEITH

Associate Professor of Geology. B.Sc., M.Sc. University of Manitoba. Formerly assistant in geology at Yale. His main interests are Paleontology and Stratigraphy. Member of Sigma Psi fraternity. He is working on his Ph.D. at Yale University.

DEPARTMENT OF CHEMISTRY

J. H. LOUDFOOT

Lecturer in Chemistry. B.Sc. from Glasgow University in 1939, followed by post-graduate work in 1940. Worked in England in the chemical industry and in Scotland doing experimental work. He also spent some time on explosives. Mr. Loudfoot lectured in Chemistry at S. E. Essex Technical College from 1945 to 1946, when he arrived in Canada to lecture at our university. He is carrying on research in Organic Chemistry.

WILLIAM DULMAGE

Lecturer in Chemistry. Mr. Dulmage's honors work following his B.Sc. was interrupted by the war in which he served as an officer in the Signal Corps and took part in the campaign in Italy. In 1946 he honored in Chemistry while studying for his M.Sc.

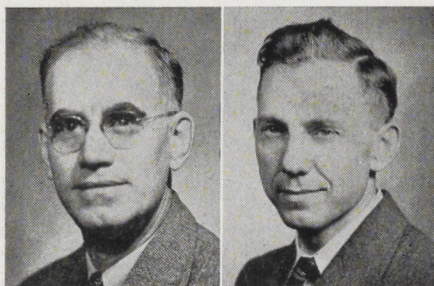


J. H. Loudfoot

William Dulmage

DEPARTMENT OF MATHEMATICS

by KEN STANDING



J. William Lawson William H. McEwen

J. WILLIAM LAWSON

Associate Professor of Mathematics. M.A., Manitoba, 1930. Formerly taught at Kelvin and Virden High Schools, and in 1930 began to instruct at the University of Manitoba. He went to Chicago every second summer to study, obtaining his Ph.D. in 1945. Dr. Lawson plans to publish his thesis soon on "Minima of Integrals over Hypersurfaces in the Calculus of Variations". He is a member of the American Mathematical Society, and his smile reflects his popularity among his students.

WILLIAM H. MCEWEN

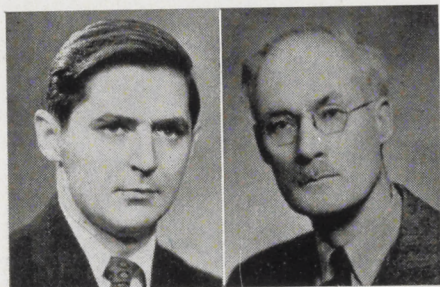
Professor of Mathematics, Head of Department of Mathematics. B.Sc., M.Sc., University of Saskatchewan, 1921-22, M.A., University of Minnesota, 1924. He taught Mathematics at Regina College 1925-29, and obtained his Ph.D. from University of Minnesota, 1930. In 1930, Dr. McEwen went to Mount Allison University as Assistant Professor of Mathematics becoming Professor and Head of the Department in 1934. This year he came to Manitoba as Head of the Department. Dr. McEwen has presented papers to the Canadian Mathematical Congress, the American Mathematical Society, and the Royal Society of Canada. His chief interest lies in analysis.

LLOYD DULMAGE

Assistant Professor of Mathematics. B.A., M.A., University of Toronto, 1939-40. Came to Manitoba in 1941, and first taught in the Actuarial Department. Mr. Dulmage has presented to the Canadian Mathematical Congress a paper on "Enumeration of the 3-rowed n -column Latin Rectangle Problem", and is now working on the r -rowed, n -column problem. Mr. Dulmage is studying for his Ph.D., which he hopes to obtain very shortly.

THESSALON HERBERT MILNE

Associate Professor of Mathematics. B.A., M.A., University of Toronto, 1915-16. Served with the Canadian Army in World War I. At the close of hostilities, he did graduate work in Chicago, then taught in Alberta and Buffalo. In 1927, Professor Milne came to the University of Manitoba and has been a member of the Mathematics Department since.



Lloyd Dulmage Thessalon H. Milne

BERNARD NOONAN

Lecturer in Mathematics. B.A., University of Manitoba, 1939. Mr. Noonan then spent a short time lecturing at the University of Manitoba and Brandon College. He attended the University of Toronto, where he obtained his M.A. in 1942, and did wartime statistical research for the Dominion Government. Last year he returned to Manitoba to lecture in mathematics and study for his Ph.D.

WILLIAM R. SHANKLIN

Assistant Professor of Mathematics. M.A. in Mathematics Mount Allison University, 1922. M.A. in Education University of Alberta, 1928. He taught Science at Portage la Prairie Collegiate 1922-23 and was on the staff at Moose Jaw Collegiate and Technical School 1923-46. This year Mr. Shanklin came to Manitoba as Assistant Professor of Mathematics.



Bernard Noonan William R. Shanklin

WALTER FLEMING

Lecturer in Mathematics. B.A., University of Saskatchewan, 1942. M.A., University of Minnesota, 1944. He taught Mathematics at Minnesota, 1942-45, the University of New Brunswick, 1945-46, and this year came to lecture at Manitoba. Mr. Fleming is studying for his Ph.D. in the summer at Minnesota. He is a member of the American Mathematical Society.

JOHN E. BISHOP

Lecturer in Mathematics. A native of New Foundland, where he taught high school for a number of years. B.A., Mount Allison University, 1943. Mr. Bishop taught at Mount Allison, 1943-44 and served two years in the R.C.N.V.R. as an Electrical Officer. He returned to Mount Allison in 1946 and this year came to Manitoba to lecture in Mathematics.

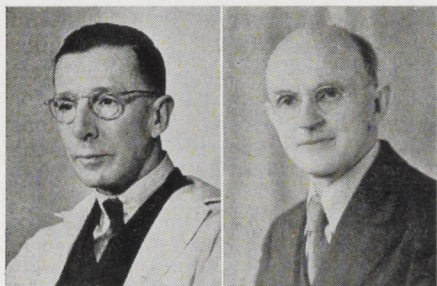


Walter Fleming John E. Bishop

DEPARTMENT OF BOTANY

By PAT PREMACHUK

WILLIAM LEACH



William Leach

Charles W. Lowe

Professor of Botany. Born in Cheshire, England. Served with R.A.F. in World War I. M.Sc., Manchester, 1924, Ph.D., Birmingham, 1930. Senior Botanist on Oxford University expedition to Lapland, D.Sc., Birmingham, 1933. Professor of Botany, University of Manitoba, 1937. An active research worker, has published some 22 papers on Plant Ecology and Physiology, and three books. In 1945 was elected Fellow of the Royal Society of Canada for his research on the causes of the Heating of Grain in Storage. Hobbies include amateur photography and horticulture.

CHARLES WILLIAM LOWE

Associate Professor of Botany. Born in Birmingham, Eng. M.Sc., Birmingham, 1915. Joined the Botany Department, University of Manitoba in 1916 and has been with us since. Professor Lowe is a member of the American Association for the Advancement of Science, the Botanical Society of America, and the American Microscopic Society. He has done research on Canadian Fresh Water Algae and Marine Diatoms, the Flora of Manitoba and similar subjects in this field. Hobbies include photography, gardening and Natural History.

JOHN CARRICK

Lecturer in Botany. Born in Glasgow, Scotland. B.Sc (Hons.), Glasgow, 1938. From 1938-40 he carried on research in the field of mycology at Glasgow. He enlisted in the British Army at the outbreak of World War II, and during his six years in the army, the last three of which he spent in India, he was attached to the experimental Radar branch. He came to Canada in the Fall of 1946. His hobbies include photography and mountain climbing.



John Carrick

DAVID ROSS MOIR

Lecturer in Botany. B.Sc. (Hons.), 1940, M.Sc., 1942, at the University of Manitoba, for which he worked as research assistant to Dr. Leach. In 1942-43 he worked under a Research Council Studentship. He was a member of the Game and Fisheries Branch for two and a half years, carrying on a biological survey of marsh areas in Manitoba, with regard to fur rehabilitation. He joined the Botany staff in 1946. His hobbies include amateur photography and woodwork.

DEPARTMENT OF MATHEMATICS

HART D. CLARK

Lecturer in Mathematics. B.A., Manitoba, 1935. Rhodes Scholarship winner. He studied at Oxford but the war overtook him before he could complete his course. Mr. Clark lectured in Mathematics last year and for first term this year, but has left to take a position with the Department of Finance, Ottawa.



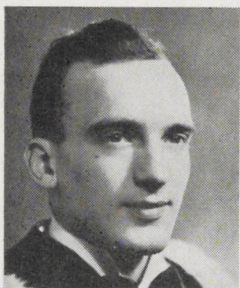
Hart D. Clark

Harold R. Saddington

HAROLD R. SADDINGTON

Lecturer in Mathematics. B.A., University of Saskatchewan, 1941. He taught high school in Saskatchewan, 1938-46 with time out for service with the R.C.N.V.R. In 1946 Mr. Saddington came to Manitoba hoping to study for his M.A. and is now lecturing in Mathematics. Has most emphatic views on attendance at classes.

THE SCIENTIFIC SOCIETY



STAN H. BALDWIN
President

purposes of the Society may be briefly summed up as follows:

(a) To provide, by means of outside speakers, an opportunity to learn about many of the recently developed aspect of their courses, which cannot be covered in regular lectures.

(b) To afford students a good opportunity to get to know their professors better, and to become acquainted with professional men in their particular field.

The Scientific Society is a sub-organization of the Science Students' Association and embraces the various organized scientific clubs on the campus. Its executive consists of the president, who sits on the Student Council, and the presidents of the various clubs. The

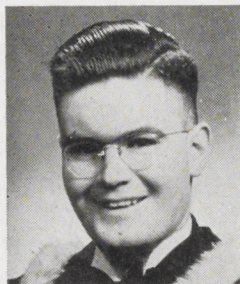
(c) To give senior students experience in presenting scientific papers and in public speaking.

It has been found very difficult to extend the full activities of the Society to Junior Division, but if there were sufficient interest and attendance it would be quite possible for the different clubs to form junior sections which would act in co-operation with the senior sections.

Students should realize that support of these clubs is definitely to their advantage. The society is backed whole-heartedly by the professors and the Student Council, the various clubs have efficient and sincere executives, and now all that is needed to make the Society a complete success is the interest and support of the students themselves.

We strongly recommend that all Science students take an active part in at least one of these clubs, and so help to derive the maximum benefit from their University education.

PHYSICS CLUB



ALASTAIR CAMERON
President

second Wednesday afternoon alternately by fifth year students and staff members; they include modern technical topics and modern contributions to physical thinking and philosophy. Before each meeting tea and refreshments were served under the capable charge of Miss Constance Cox and Miss Eva Onofreyo.

The following lectures have been given this year:

The Physics Club exists for the benefit of senior students and members of the Department of Physics. It was a little late in starting this year, but, once underway, a very interesting series of lectures have been given in the club. Papers have been presented every

"Milne's Cosmology" by Mr. Alastair Cameron.

"Directional Antennas" by Mr. Bruce Lutz.

"The Electron Microscope" by Mr. Robert McLaughlin.

At the time of writing these lectures have been scheduled:

"Physics of Surface Films" by Dr. Whitmore.

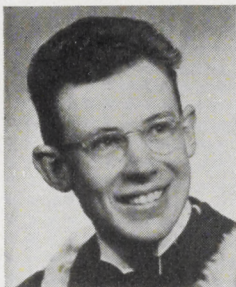
"Theory of the Chain—Reacting Pile" by Mr. Douglas Milton.

"Circulation of the Atmosphere" by Dr. Neamtan.

"Philosophical Implications of Quantum Mechanics" by Mr. Lynn Watt.

A special lecture will be given on March 24, to wind up the series. Dr. Infeld, of the Department of Mathematics, University of Toronto, will be in Winnipeg on that date, and he has very kindly offered to speak on "Modern Cosmology." This is his special field of interest; he has worked in collaboration with Dr. Einstein and published an important book on the subject. Everyone is cordially invited to attend.

MATHEMATICS CLUB



KEN STANDING
President

standing of the field of mathematics, and especially of topics outside the academic courses.

The club holds evening meetings at which visitors, members of the staff, or students speak on some phase of mathematics, with discussion following over coffee. Problems are regularly presented for solution, and arguments usually last until the caretaker has put us out of the Broadway Cafeteria with the cat.

Among speakers during first term this year have been: Dr. W. H. McEwen—"Application of Mathematics to Economics"; Mr. Leo Moser of the University of Toronto—"Mathematical Recreations"; and Ken Standing—"A Development of Conics."

CHEMISTRY CLUB



HUGH J. ANDERSON
President

him an idea of the various industrial applications of chemistry, and;

2. To further the knowledge of the student along lines which are seldom touched in undergraduate courses.

In order to accomplish the aims of the club, talks are given by members of the

The Mathematics Club is enjoying an active year of operation under the Scientific Society. At the first meeting an enthusiastic group of members elected Ken Standing as President and Bert Calhoun Secretary. The club has tried to give its members some under-

chemistry department, guests, and some of the students. In addition several industrial tours have been organized, the first, to the Manitoba Sugar Company, was made before Christmas.

Some of the talks given so far have been: "The Chemical Institute of Canada" by Dr. A. D. Robinson, "Petroleum Chemistry" by Mr. E. J. Pritchard; "Emulsion Copolymerization" by Dr. Milton Kirsch; "Industrial Chemistry" by Mr. D. E. B. Stevenson; and "Recent Development in Plastics" by Mr. L. A. Rodgers of the Canadian General Electric.

Future topics include: "The Distillation of a Ternary Mixture" by Dr. A. N. Campbell; "Spectroscopic Analysis of Zinc" by Lawrence B. Buchanan; "Paper Manufacture" by Stanley H. Baldwin. Also Dr. C. H. Wright the president of The Chemical Institute of Canada will visit the club which is a student chapter of the C.I.C.

GEOLOGY CLUB



TED PURCELL
President

have thirty-nine student members receiving their monthly bulletin.

To date, the following speakers have presented papers to the Geology Club: F. Harris—Geological Mapping with Aerial Photos. Miss R. Thompson—Petroleum Geology. L. Montgomery—Field Work in the North-West Territories. Mr. J. Richardson—Film on Gold Mining and Milling. T. P. Storey—Norman Wells Oil Project. J. Davies—Geophysical Methods. Prof. E. S. Leith—Film on Gold Placer Mining. T. S. Smith—Gemstones Through the Ages. D. Robertson—History of Geology. J. McMilan—Meteorites.

Officers of the Geology Club include:

T. Purcell—*President*.

Miss L. Riddell—*Vice-President*.

F. Harris—*Secretary-Treasurer*.



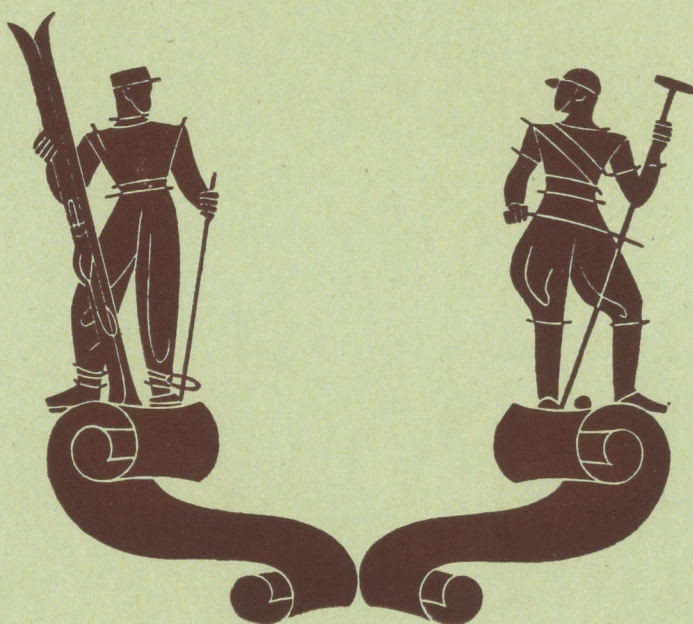
SENIOR SCIENCE COUNCIL

Back Row—"Scottie" McPherson (Sr. U.M.S.U. Rep.), Stew Northcote (Men's Athletics), Dick Wilson (A.B.C. Rep.), Stan L. Baldwin (Social Chairman), Gordon Bell (President, Third Year).

Second Row—Gordon Skinner ("Question Mark"), Brian Dickson (Debating), Margaret Raven (Dramatics), Shirley Jackson ("Brown and Gold"), Dot Friskin (Ladies' Club), Ruth McElheran ("Manitoban"), Pam Weiss (Ladies' Athletics), Jaspar Conn (Treasurer), Stan H. Baldwin (Scientific Society).

Front Row—Doreen Mosley (Secretary), Jeff Anderson (Junior Stick), Gladys Salisbury (Junior Lady Stick), Don Kepron (Senior Stick), Ann Hall (Lady Stick), Jerry Vickers ("Question Mark").

Sports



HOCKEY



SENIOR HOCKEY

Back Row—Wally Stackiw, John Poersch, Tom Goodhand, Sam Langford, John Johanson.
Front Row—Irvin Labovitch, Ross Sowak, John Placentine, Pat Premachuk, Gordon Thompson.



JUNIOR HOCKEY

Back Row—Wilf Juravsky (Player-coach), Bob Shepherd, Don Nellis, Tom Nielson, Bernie Derback, Ed Abbott, Maurice Chornoboy.
Front Row—Sam Minuk, Paul Novasat, Jack "Turk" Placentine, Roy Butler, George Petcaw.

SOCCER



SENIOR SOCCER

Back Row—Harold Johnson, Stan Baldwin, Jaspas Conn, Stew Northcote, Lawrence Buchanan.
 Front Row—Dave Robertson, Jim Tereschuk, Dave Peterson, Eph Miller.
 Missing—Tom Goodhand, Pat Premachuk, Don McDougall, Irvin Labovitch.



JUNIOR SOCCER

Back Row—Keith Lord, Noel Pritchard, Jeff Anderson (Capt), Clyde Pickup, Edward Collins.
 Front Row—Bill Sloan, Don McGuiness, Dick Gilhuly, Gordon Cormie, Wilf Juravsky.

TRACK



GIRLS' TRACK TEAM

Back Row—Audrey Jones, Margaret MacKeen, Helen Barnes, Dorothy McKitrick, Pam Weiss.
Front Row—Audrey Haywood, Shirley Jackson, Geraldine Warthe, Verna Peto.

BASKETBALL



GIRLS' BASKETBALL

Back Row—Ruth Thompson, Margaret MacKeen, Pam Weiss, Doreen Mosley, Ann Hall.
Front Row—Theresa Perkes, Pat Clark, Shirley Jackson, Shirley Swail.

BASKETBALL



SENIOR BASKETBALL

Back Row—Lawrence Buchanan, Clarence Breen, Jack MacKenzie, Dave Peterson, Murray Brener.
Front Row—Don Wood, Jack Martin, Eph Miller, Art Wittenberg, Murray Smith.



JUNIOR BASKETBALL

Back Row—Bernie Derback, Jim Doherty, Ron McIntosh, Alan Dales, Gunnar Eggertson.
Front Row—Bill Sloan, Jaspas Conn, Eph Miller, Colin McGillivray, Don Guthrie.

CURLING



GIRLS' CURLING

Ruth Thompson (Skip), Dorothy Brown, Anne Karasiewich, Margaret MacKeen.



GIRLS' CURLING

Dorothy McKittrick, Helen Charenko (Skip), Libby Bookhalter, (missing) Enid Morris.

VOLLEYBALL



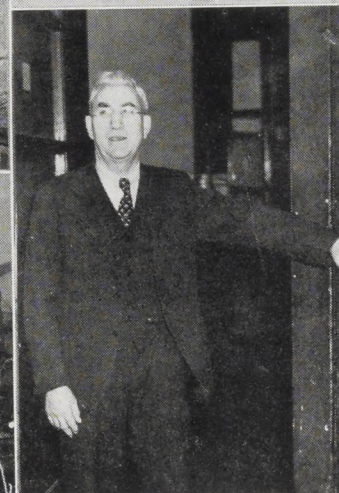
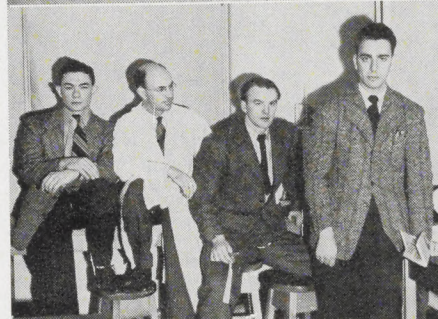
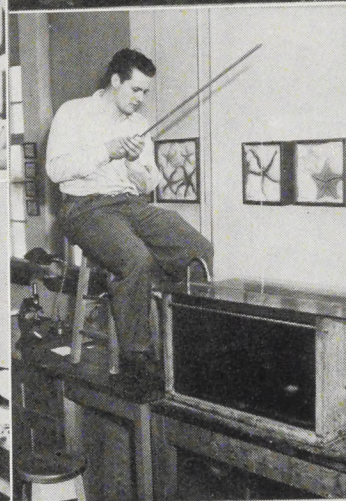
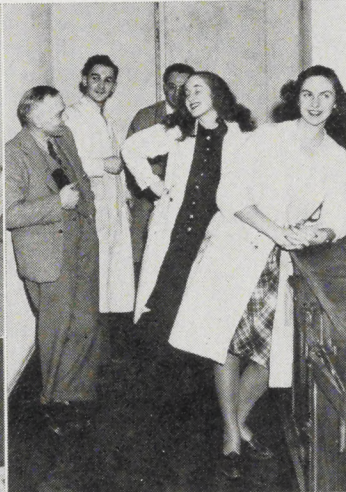
GIRLS' VOLLEYBALL

Back Row—Audrey Jones, Pat Clark, Helen Barnes, Margaret MacKeen, Ann Karasiewich, Dorothy McKittrick.
Front Row—Audrey Haywood, Shirley Jackson, Marion Sugden, Verna Peto, Ruth Thompson.



BOYS' VOLLEYBALL

Back Row—Jim Kay, Rudy Pitzek, Dennis Lethbridge, Stew Northcote.
Front Row—Bill Daniels, Eph Miller, Dick Wilson.



Top Left—Open the Door, Richard.

Top Left, Centre—Keystone Cops.

Bottom Left, Centre—Specimens or Students?

Bottom Left—Ooh La La!

Top Centre—Oh! Doctor!

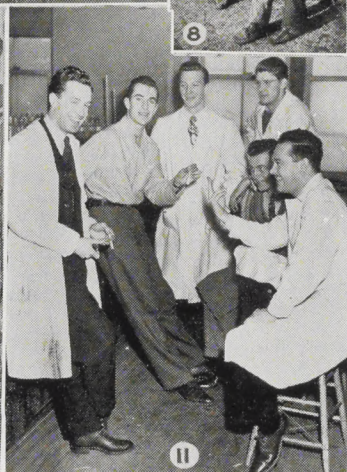
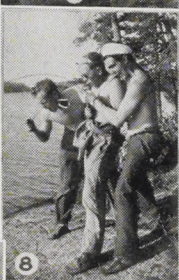
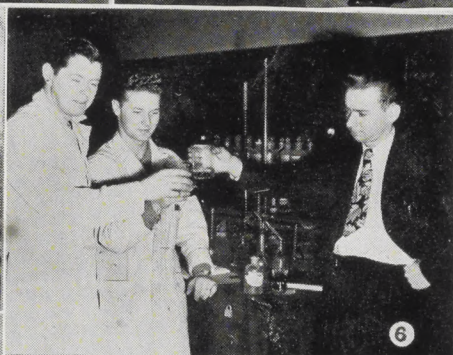
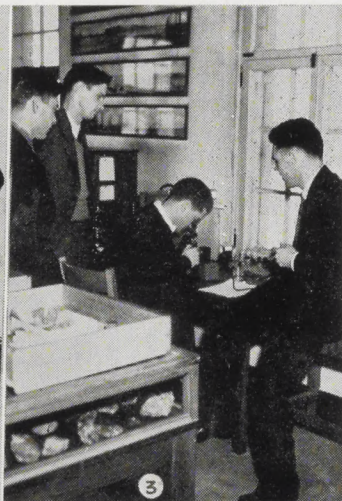
Centre—Fishing for the Halibut.

Bottom Centre—Note the Specimen in the Background.

Top Right—Fairy Chorus.

Centre Right—Where's Marian?

Bottom Right—Where are my Boys?



1. Four-unit subject.
2. Now, where was I?
3. Peek-a-boo!

4. One-track mind.
5. Look out, there!
6. The finished product.
7. Bachelors' quarters.
8. Some fish!

9. Varieties.
10. Here's to Science.
11. The hot testube league.
12. Huggin' and chockin'.

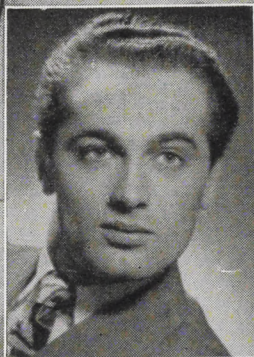


'HOO'S
'HOO
IN
SCIENCE



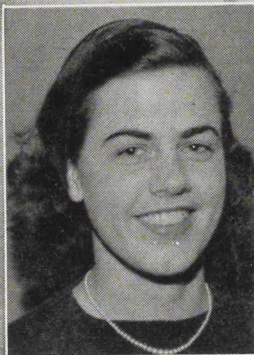
DON KEPRON

This boy is Senior Stick of Science, member of the Phi Kappa Pi outfit and is the Vice-Pres. of the A.B.C. (He eliminates the vice.) Crack(ed) athlete. Possesses a sizeable harem and spends half his time commuting between United and Fort Garry (thanks A. H.). His ambition is to pass fourth year in one bound.



CHRIS NEWMAN

Science's Freshie Queen Candidate who gracefully came in from Selkirk to sit atop Jeff Anderson's beer wagon in the Freshie Day Parade. Chris, although a novice, is fast becoming a star skier besides being a veteran at basketball and volleyball. Her sorority is Kappa Kappa Gamma. She is an ardent supporter of varsity teams and varsity events in general. All her seventeen years have been spent in enjoying life and when questioned on her future she replied, "Don't ask me".



STEWART NORTHCOTE

An ex-navy man now in Science IV. Besides being a star basketballer, he is the very efficient senior sports' president of this faculty. Along with Baldwin he makes our council meetings what they are—a council meeting plus. Did a fine job organizing the sports section of this publication.



ANNE HALL

Fourth Year, Zoology and Botany. Our charming Lady Stick hails from Elmwood and Lord Selkirk High School. Excellent athlete and a capable (believe it or not) car driver. Active participant in all University affairs—member of Delta Delta Sorority. Typical remark of Anne's: "Wanna usher?" Ambition: A B.Sc this spring. Future: Lot's of friends and happiness.



JASPAR J. CONN Jr.

Science IV. Honors in Chemistry. High School, Kelvin. Activities, Assistant Treasurer 45-46, Treasurer, 46-47. Ambition, Further work in chemistry. He dreams of a \$1,000 a month job and a harem. Perennial wit. Keeps returning to Flin Flon every summer for reasons unknown. He gave up the art of weight-lifting in favor of basketball and skiing—a wise move. Instructs weekly in Chem. III Labs.



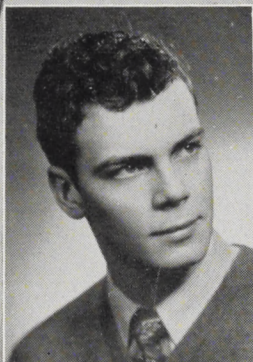
VERNA PETO

President of W.A.D. 46-47. Verna should be called "Miss Basketball" of the Bisonettes since she has starred for the last two years. She also engages in volleyball, track and swimming. Her ambition is occupational - therapy, whatever that is.



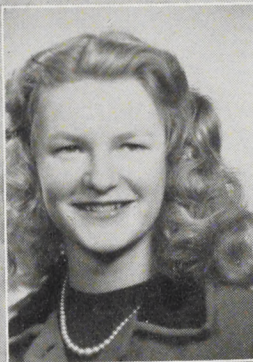
JEFF ANDERSON

Science's handsome Junior Stick whose interests lie more in Home-Ec than in Science. Taking Pre-Med, he is also the president of the Broadway Campus Committee. Jeff likes sports and as well as playing basketball, soccer and baseball, he has a habit of "getting" guys three times his size on the gridiron. He is a member of Sigma Lambda Phi Fraternity and has two great ambitions: 1 To become a doctor; 2 To have the Winnipeg Electric Co. improve the bus service to East St. Paul.



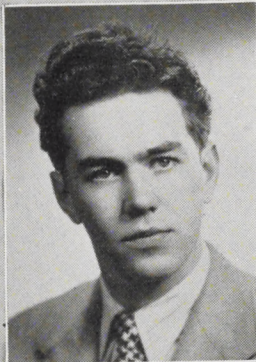
DOREEN MOSELY

Third Science — Kelvin graduate. Convenor of sponsoring 1945-46. Second vice-president of sorority Alpha Delta Pi 1946-47. Competent secretary for the Senior Science Council 1946-47. A keen basketballer for the faculty. Fond of books and a true friend to all who know her.



STEW HODGSON

A Kelvin product, Stew is known around the halls of Broadway as "Hans". In Pre-Med II, the pride of Delta Upsilon manages to be called an athlete (and a pretty good one at that) and plays soccer as well as hockey and skiing. Once had his picture on a magazine cover captioned "Send this boy to camp—but quick". Last year he was voted Mr. High Principles of 1946 and is suspected of being the reason that Prof. Wardle's preserving alcohol evaporated. His activities range from being president of Pre-Med and active worker on the B.C.C., to doing research on a hangover cure in the Chemistry Lab. His ambition is to be a nice man in a white coat, and also to revive the Scientific Workers Cultural Association.

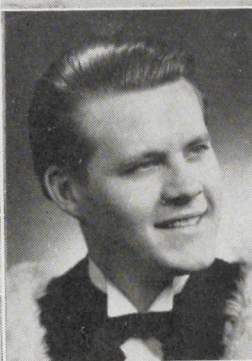


GLADYS SALISBURY

Our Lady Stick who is also in Pre-Med. Gladys hails from Brandon Collegiate and has since emigrated from the Wheat City to our own fair halls of learning. A veritable work horse, she has probably done more work this year than in her first seventeen years rolled into one.

STANLEY L. BALDWIN

Science 4H. Zoology and Chemistry. "Stash", as he is informally known, is doing a grand job as our social chairman. Despite his many obligations he still finds time to play soccer and volleyball, and to play golf with the girls. Along with Northcote he manages to make us believe that something is done at the Council meetings. When he isn't fishing in Prof. Stewart-Hay's Zoology tank, (see candid page) he manages to dash off to Gimli and Kansas City in his battered heap. He is noted for his various humorous verbal ejaculations in the Embryology classes. His ambitions are to be a first-class Leninologist, and to catch a fish or something in that Zoology tank.



PAM WEISS

Third year Zoology and Chemistry. Kelvin High School. Pres. of Women's Athletics, Junior Athletics Rep. 44-45 and a host of other activities. Has played for Varsity Basketball teams for three years and is captain this year. Other athletics include volleyball, swimming, diving, track and field. Seemed to be interested in photography but complains that she is unable to see what goes on in the dark-room.



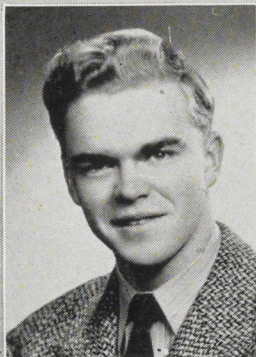
EVELYN SHINOFF

Academically, 2nd Year Science. Ambition: To be academically 3rd year Science next year. The blonde brain from St. John's Tech. Has starred for Bisonettes for last two years. Personality kid. Very interested in women's athletics. The girl elected most desirable to be cast on a desert island with. Wonder if she can knit diamond socks?



KEITH LORD

Keith blew in to Science I from Fort William, Ont., and subsequently blew into the position of Junior Sports Chairman. A great athlete himself, Lordy starred with the Varsity Football team last fall. He plays every other sport possible including soccer, basketball, hockey, baseball, skiing and Cardinal Puff. He is a member of Sigma Lambda Phi Fraternity. Every Tuesday afternoon Lordy sits in the Physics Lab with Hank Owens and spends an hour out of every five minutes taking time out for a smoke. Other than his athletic and scholastic ability he is talented in the arts of salesmanship and girling. His ambition is to become a dentist for dentists only.



MORAG MACDONALD

Science II—High School, Kelvin.

Activities—Junior Social Rep. 46-47.

Interests—People. Further information on request.

Ambition—To convince Dr. Hiebert and Dr. Kirsch that woman's place is **not** in the home, and to prove that all female science students do **not** graduate at the altar.



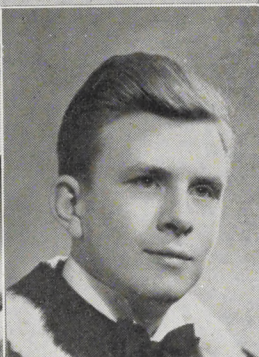
DONALD A. GUTHRIE

Academically: Chem. 5H. High School: West Kil-donan Collegiate.

Fraternity: Delta Kappa Epsilon.

Activities: Junior Science Treasurer, 43-44.

Ambitions: After graduating this year he intends to continue P.G. studies in organic analysis at Toronto.



MARG. RAVEN

Science's gift to the theatrical world. Highly successful not only as an actress but also as a director. She has lovely soft, blonde hair, an infectious laugh and a sparkingly smile. Altogether, a great build-up, eh? Her ambition is to practice psychology with James Mason (psychology, that is).



WILF JURAVSKY

Second Year. Science's little giant. Has starred on Science hockey teams for last two years. Other sports include basketball and soccer. Served time in the R.C.A.F.





University of Manitoba

February, 1947



Winnipeg, Manitoba



JUNIOR SCIENCE COUNCIL

Back Row—Jerry Winkler, Keith Lord, Glen Anderson, George MacCauley, Noel Pritchard, Lawrence Rawlinson, Gerry Vickers, (friend), Bill Kennedy.

Front Row—Evelyn Shinoff, Libbie Bookhalter, Gladys Salisbury (Junior Lady Stick), Jeff Anderson (Junior Stick), Florence Shaen, Moirag MacDonald. Missing: Christine Newman, Stuart Hodson.



FIFTH YEAR SCIENCE

Back Row—Stan Baldwin, Jasper Conn, Lawrence "Buck" Buchanan, Sam Loshivao, Bernard Derback, Bob McLaughlin, Alastair Cameron.
Front Row—Taras Storey, Doug Milton, Gord Thompson, Don Guthrie, Hugh Anderson, Gord Skinner.



FOURTH YEAR SCIENCE

Back Row—Pat Premachuk, Bill Medway, Stan Baldwin, Manly Levin, Tom Goodhand, Bruce Watson, Roland Quarnstrom, Norman Corbett, Dick Wilson, John Dempster, Howie Fairbairn, Cyril Lee, Glenn Mansell, Jack McMillan, Isaac Farn, Tom Oliver, Max Robinson.

Fourth Row—Fred Rekrut, George Camself, Shogi Takahashi, Bill Newfield, Albert Gilmore, Ken Standing, Bert Calhoun, Hirokozu Morita, Bill Ewart, Ed Kimelman, Len Cohen, Nick Neufeld.

Third Row—Ralph Boonov, Percy Tucker, Grant Robertson, Verna Peto, Jack MacKenzie, Fred Waugh, Dorothy Friskin, Jack Glover, Shirley Rosenbaum, Olive Pincock, Peter Jackin, Connie Cox, Stew Northcote, Theresa Perkes, Edith Turtle, Fred Harris, Marion King, Ruth Thompson, Charlie Markusoff, Gloria Ohlson.

Second Row—Iris Reid, Marion Sugden, Margaret Raven, Ann Karasiewicz, Margaret Hample, Eileen McFetridge, Lucille Labarge, Irene Antonick, Geraldine Warthe, Helen Pinlak, Joy Macey.

Front Row—Alex Anstruther, Eddy Bass, Tom Osborne, Ray Hales, Lincoln Montgomery, Mike Slobodian, John Arnason.



THIRD YEAR SCIENCE

Back Row—Hugh MacGillivray, Albert Kowalski, John Neufeld, Alex Strelloff, Erwin Penner, Dave Peterson, Bob Hinch, Morley Rosenfield, Tom Meadows, John Nickerson, John Goosen, Kell Collins, Paul Griffin, Nev Turner, Don MacDougall, Dave Permack, Ken Love, Gordy Lee, Duke Wilson, Keith Abel, Blaire Mitchell, Leo Desautels, Mindy Myrdal, John Johanson, Mel Woods, Don Bradley, Lyle Patrick, Ivan English, Andy Baillie, Norm Currie, Charlie Bell, Paul Lemieux, John Tetrault, Tom Costley.

Fourth Row—Rade Calich, Alphonse Lefebvre, Walter Prysiak, Rudy Pitzek, Isaac "Ike" Sawatsky, Owen Rutherford, Ian Dagg, Stan Caha, Bill Forbes, Nick Blonar, John Dyck, Don Dereniowski, Evan Slitt, Nick Dornian.

Third Row—Ben Janz, Al Hayward, Frank Yashchuk, Marg Hammett, Frank Cushing, Donna Armstrong, Jim Morrow, Dolores Eylands, Harold Christie, Lois Kane, Len Fowell, Elinor Kartzmark, Tom Edmundson, Avis Olson, Ernest Reid, Lillian Diakow, Pete Klassen, Lois Hokanson, John Warkentin, Evelyn Rivers, Ruth McElheran, Helen Barnes, Doreen Mosley, Hugh Hunter, Janie McPherson, Bill Archer, Gayda MacLean, Joe Tetrault.

Second Row—Shirley Jackson, Pam Weiss, Roberta Hutchinson, Pat Clark, Allison Young, Elizabeth Wetton, Anne Grassler, Hazel Earl, Rae Andrews, Eleanor Sutherland, Eha Johanson.

Front Row—Bill Daniels, Sam Langford, Fred Hastings, Ted Shanks, Bob McGirr, Gordon Breckman, Bert Bobie, Chester Kuryliw, Trevor Yipchoy, George Bondar, Nick Oleynick, Sam Hrushovetz.



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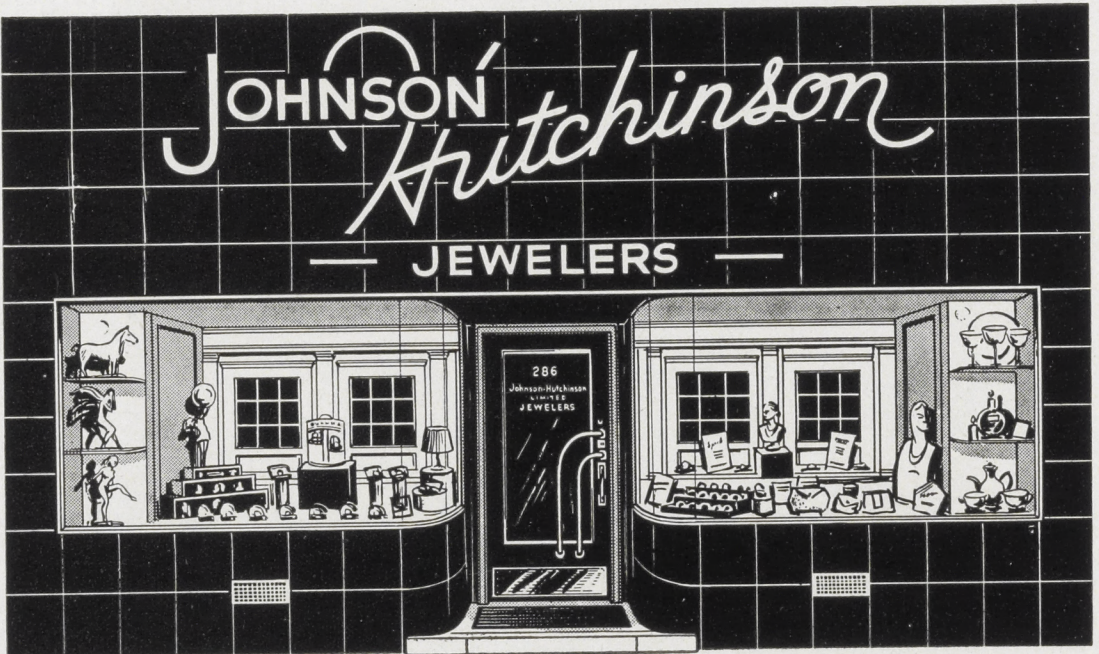
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